Using RunII SUSY/Higgs Workshop Results for 4b Reach for Orbach

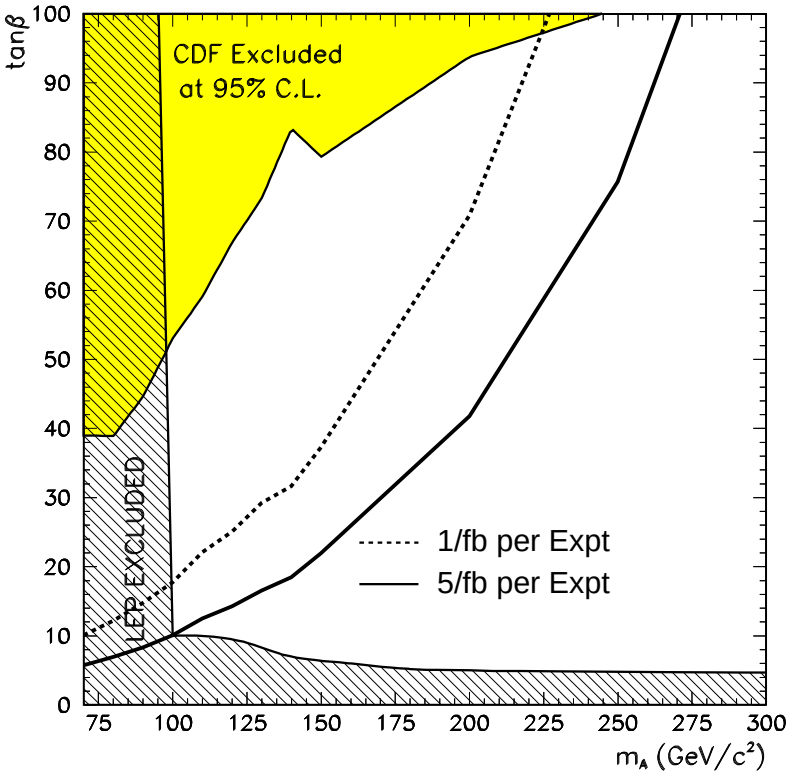
- Our RunII $\mathrm{p\bar{p}} \to \mathrm{b\bar{b}A} \to \mathrm{b\bar{b}b\bar{b}}$ analysis is not yet ready for Orbach's presentation
- Can we use Juan Valls' RunII SUSY/Higgs Workshop results?
- Yes, with some caveats, and possible adjustments
- He assumes following
  - He uses $\mathrm{t\bar{t}}$ multijet trigger (less eff than current MSSM Higgs trigger by $\sim \times 2$)
  - Takes b-tag eff from RunI in $|\eta| < 1$ and applies it to gen-level partons in $2 < |\eta| < 1$ (gain of $\sim \times 2$ in eff for b-tag in $|\eta| < 1$)
  - Evaluates reach only in Minimal Mixing scenario ($\sim$optimistic)
  - Uses "old style" statistical techniques
- If assume current b-tag, eta extension $\sim$cancels with gain from new trigger
- Take RunII Workshop results and superimpose on current limit plot for 95%CL and 5σ discovery for 2 pb^{-1} and 10 pb^{-1} scenarios
- Possibly, re-evaluate limits with current CL_s (means we need new signal xsec ntuple)

Results taken from Juan Valls' RunII Wkshp Rpt

m_{h} (GeV)	N_{bg}	ϵ_{sig}
70	90.4 ± 16.7	0.0033 ± 0.0001
80	90.7 ± 16.6	0.0038 ± 0.0001
90	88.1 ± 16.3	0.0042 ± 0.0001
100	82.3 ± 15.6	0.0044 ± 0.0001
110	76.3 ± 14.0	0.0046 ± 0.0001
120	72.9 ± 12.8	0.0052 ± 0.0001
130	68.2 ± 12.9	0.0051 ± 0.0002
140	48.2 ± 9.3	0.0054 ± 0.0001
150	39.3 ± 7.8	0.0053 ± 0.0002
200	13.7 ± 3.6	0.0042 ± 0.0002
250	2.2 ± 0.9	0.0024 ± 0.0001
300	1.6 ± 0.8	0.0018 ± 0.0001

RunII Workshop Results vs Current Limits

95% CL Exclusion



5σ Discovery